

**Virginia City Hybrid Energy Center**  
**Response to Data Request**  
**Bruce Buckheit, Member, Virginia Air Pollution Control Board**

**Question (Page No. 14):**

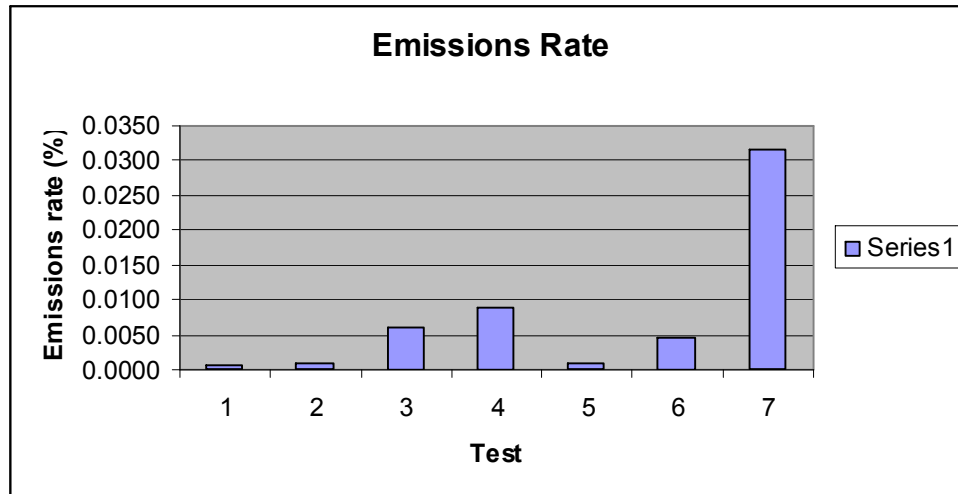
The BACT Analysis references Dominion's view that such a system is capable of capturing 98% of the incoming mercury and proposes to set MACT and BACT limits based on that capture efficiency and the mercury content of unwashed coal and waste coals suggested by Dominion. Dominion cites a specific EPA memorandum in support of this estimate ("the Wayland memo"), which is specifically cited elsewhere in this memorandum. A review of the underlying data demonstrates that far better performance has been achieved in similar units and that further evaluation of this issue is warranted. See also, [http://www.arippa.org/members\\_plants.asp](http://www.arippa.org/members_plants.asp) for generalized information about these units.

Kline Township Cogen Waste Anthracite FBC/FF	99.95
Scrubgrass Generating GEN 1 Waste Bituminous FBC/FF	99.92
Cambria Cogen Facility GEN 1 Waste Bituminous FBC/FF	99.41
Colver Power Plant COLV Waste Bituminous FBC/FF	99.10
Ebensburg Power (2004) GEN 1 Waste Bituminous FBC/FF	99.91
Ebensburg Power (2005) GEN 1 Waste Bituminous FBC/FF	99.55
Scrubgrass Generating (2005) GEN 1 Waste Bituminous FBC/FF	99.24
Wheelabrator Frackville GEN 1 Waste Anthracite FBC/FF	96.85
Average percent reduction	99.24

The Frackville unit, for whatever reason appears to have unusually low efficiency. It is a different design than the others and somewhat smaller. In addition, the unit may have been burning lower quality fuels or injecting less than optimal quantities of limestone than its peers. With the data for this unit removed from the calculation the average is 99.56 and the standard deviation falls from 1.02% to 0.351%. However, each of these units is substantially smaller than the VCHEC and may not be representative of the performance that can be expected from VCHEC. Data for operations at Seward Station<sup>1</sup>, which is in the same size class and employs similar technology and proposed feed stocks, should be obtained if available.

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<sup>1</sup>See, [http://www.energyonline.com/Industry/News.aspx?NewsID=6826&Reliant\\_Dedicates\\_Seward\\_Coal\\_Plant](http://www.energyonline.com/Industry/News.aspx?NewsID=6826&Reliant_Dedicates_Seward_Coal_Plant)



This data compares differences between units and so it may overstate the variability of the expected performance. Nonetheless, if we assume that these results are a series of tests for a unit to look at the limits that would be appropriate for VCHEC. Using EPA's statistical approach, but discarding the Wheelabrator test would give a short term average of 99.05% - suitable for setting a three hour average such as would be appropriate for a BACT determination. However, for purposes of determining whether annual mercury emissions meet a MACT floor or for setting MACT itself, variations tend toward the mean, suggesting that an efficiency of 99.5% or higher might be a more valid representation of the Dominion system. There may be additional data available at this time, including Hg CEM data which may provide additional information.

### Response:

Emission control levels must be established as enforceable limits that can be achieved continuously for year after year of operation. Simply because a given unit recorded a low emission rate at some point in its operation, does not mean that it could continue to operate at a lower enforceable permit limit all of the time. For these reasons, actual stack emission data will always reflect lower mass emissions than allowed via permitted limits, and this margin will exist equally for all top level of control equipped facilities (including the proposed VCHEC). Thus, we believe the best practical measure of emissions reductions demonstrated continuously in practice is continuous compliance with an enforceable emission limitation. Consideration of actual stack emission data is useful only to the extent that it demonstrates how much lower actual emissions may be compared with permitted not-to-exceed limits.

### Table on Page 14 of Comment Letter

The 1999 Kline and Scrubgrass tests referenced on page 14 of the document and listed in the Wayland memo were ICR-3 tests; the Hg measurements taken across the baghouses were conducted using the Ontario-Hydro (OH) method. For these tests, the majority of

the Hg was particulate but even the particulate Hg measurement can be difficult with the OH method as stated by two Hg experts. Dennis Laudal, EERC stated those errors on page 20 (of 41) in his field validation report. Connie Senior, Reaction Engineering, referenced some of the ICR Hg measurement problems pgs 12-15, most notably the problems with mass balance closure (4th bullet on page 15).

#### **Confidence Limit for Overall Hg Control**

In the Wayland memo, some of these known Hg measurement errors are accounted for by applying Confidence Limit equation which sets the control at 98% for Coal Refuse boilers.

#### **Wayland Memo-Further Information**

Page 3 states, "For all coal ranks except coal refuse, the control efficiency used was the greater of that achieved either from coal-to-the-stack or across the control device as shown through the ICR-3 3-run averages. The data provided by ARIPPA for coal refuse did not include testing prior to the final control device so only coal-to-stack data was available for this coal rank." Page 12 of the memo states, "ARRIPPA identified 15 additional test runs for which contemporaneous fuel data was not available but for which fuel data were available at or near the time of the stack test." The fact that uncontrolled Hg emissions were determined by coal samples that were not taken during the stack test but at some other time makes the Hg control efficiencies in the commenter's letter entirely unreliable.